

IN THE CLAIMS:

1. (original) A process for the preparation of water soluble polypyrrole comprising admixing pyrrole, water, and an effective amount of an electroinactive water soluble polycation to form an initial composition, admixing said initial composition with an effective amount of an oxidizer compatible with said pyrrole over a sufficient time and temperature effective to form a reacting composition so as to determine the potential thereof, and allowing said reacting composition to react for a time sufficient until substantially no decrease in potential occurs, whereby said soluble polypyrrole is formed.

2. (original) The process of Claim 1 wherein said initial composition is cooled to a temperature in the range from about 0 °C to about 25° C.

3. (original) The process of Claim 1 where said polypyrrole formed is removed from said reacted composition.

4. (original) The process of Claim 1 wherein said admixing is carried out in a controlled manner.

5. (original) The process of Claim 1 wherein an oxidizing agent is admixed in said initial composition.

6. (original) The process of Claim 1 wherein said electroinactive water soluble polycation is a quaternary cation.

7. (original) The process of Claim 6 wherein said polycation comprises one or more polydiallyldimethylammonium salts.

8. (original) The process of Claim 7 wherein said polydiallyldimethylammonium salts are selected from a group of organic and inorganic and inorganic anions and acetate and inorganic anions consisting of p-toluenesulfonate, benzenesulfonate, methanesulfonate, bromide, chloride, tetrafluoroborate, hexafluorophosphate and fluorosulfonate.

9. (original) The process of Claim 6 wherein said polycation comprises one or more poly(2-vinylpyridinium)salts.

10. (original) The process of Claim 9 wherein said poly (2-vinylpyridinium) salts are selected from a group of organic and inorganic anions consisting of p-toluenesulfonate, benzenesulfonate, methanesulfonate, acetate, bromide, chloride, tetrafluoroborate, hexafluorophosphate, fluorosulfonate, and the like.

11. (original) The process of Claim 6 wherein said polycation comprises one or more poly (4-vinylpyridinium) salts.

12. (original) The process of Claim 11 wherein said poly(4-vinylpyridinium)salts are selected from a group consisting of 1-methyl-4-vinyl-pyridinium trifluoromethane sulfonate, poly(4-vinyl-1-pyridinium) salts, poly(methacrylamidopropyltrimethylammonium salts), poly(4-vinylbenzyltrimethylammonium, and the like.

13. (original) The process of Claim 1 wherein said step of admixing pyrrole and water is at a pH in the range of about 0.1 to about 6.

14. (original) The process of Claim 13 wherein said pH is in the range from about 0.2 to about 2.

15. (original) The process of Claim 1 having a concentration of pyrrole to anion from about 0.1% w/w to about 8% w/w.

16. (original) The process of Claim 15 wherein said concentration is from about 2% w/w to about 6%w/w.

17. (original) The process of Claim 16 having a ratio of pyrrole to oxidant in equivalents of about 4/1 to about 1/4.

18. (original) The process of Claim 17 wherein said ratio is in the range from about 2/1 to about 1/3.

19. (original) The process of Claim 1 having a weight ratio of said pyrrole to said water soluble polycation from about 15/1 to about 1/10.

20. (original) The process of Claim 19 wherein said ratio is from about 10/1 to about 1/10.

21. (original) The process of Claim 1 wherein the water soluble polycation is a quaternary ammonium polymer.

22. (original) The process of Claim 21 wherein said quaternary ammonium polymer has a molecular weight in the range from about 5000 to about 500,000.

23. (original) The process of Claim 22 wherein said quaternary ammonium polymer has a molecular weight in the range from about 50,000 to about 400,000.

24. (original) The process of Claim 3 wherein the removal of water soluble polypyrrole from said reacted composition is accomplished by admixing acetone to said reacted composition.

25. (original) The process of Claim 24 having a ratio of reaction composition to said acetone in the range from about 1/1 to about 1/10.

26. (original) The process of Claim 25 wherein said ratio is in the range from about 1/2 to about 1/5.

27. (original) The process of Claim 1 wherein the water soluble polypyrrole formed has an electrical conductivity in the range from about 10^0 to about 10^{-5} S/cm.

28. (original) The water soluble polypyrrole of Claim 27 wherein said electrical conductivity is in the range from about 10^{-1} to about 10^{-4} S/cm.

29. (original) The process of Claim 1 wherein said water soluble polypyrrole is in powder form.

30. (original) The process of Claim 29 wherein said powder form can be redissolved in water with agitation.

31. (original) The process of Claim 3 wherein the water soluble polypyrrole in powder form.

32. (original) The process of Claim 31 wherein said powder form can be redissolved in water with agitation.

33. (original) A water soluble copolymer of pyrrole, or derivatives thereof, prepared by the process of Claim 1.

34. (original) A water soluble copolymer of homopolymer of substituted pyrrole, or derivatives thereof, prepared by the process of Claim 2.

35. (original) A water soluble copolymer of polypyrrole prepared by the process of Claim 3.

36. (original) A water soluble copolymer of polypyrrole having an electrical conductivity in the range from about 10^0 to about 10^{-5} S/cm.

37. (original) The water soluble copolymer of polypyrrole of Claim 32 wherein said electrical conductivity is in the range from about 10^{-1} to about 10^{-4} S/cm.

38-76. (canceled).